Editorial: Special Issue on “Distributed and Secure Cloud Clustering (DISC)”

**Selected Topics from the Strategic Workshop, May 26–28, 2010,
Florence, Italy**

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Published online: 23 April 2011
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The 12th Edition of the closed-door strategic workshop was held in Florence, Italy from 26th to 28th May, 2010. The focus during the active two-day discussions of the participating major stakeholders was on distributed and secured cloud clustering (DISC).

DISC was the theme of the 12th strategic workshop. The term cloud clustering comes from the use of a cloud image to represent the internet or some large networked environment. The main concern today is to how user can depend on reliably sending of data to and receiving data from the cloud. Cloud clustering is associated with a higher level abstraction of the cloud. Now there is Services, instead of data pipes, routers and servers.

This special issue features ten selected papers covering various aspects of DISC including business model and new key distribution technology for cryptographic keys, called QKD (quantum key distribution).

The first paper, “Wireless Going in the Cloud: A Promising Concept or Just Marketing Hype?” by Spyridon Vassilaras and Gregory Yvanof, presents a comprehensive overview of the use of the terms cloud and cloud computing in the wireless domain. Cloud computing is a computing service paradigm which attracts increasing attention from academia and industry. This paper investigates the use of the terms cloud and cloud computing in the wireless communications and networking domain.

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The second paper, “Cloud Based Infrastructure, the New Business Possibilities and Barriers” by Christian Kloch, Ebbe B. Petersen and Ole Brun Madsen, focuses on the combination of e-commerce, cloud computing and broadband infrastructure, and its unique possibilities for the overall IT society.

The third paper, “User Centric Community Clouds” by João Paulo Barraca, Alfredo Matos and Rui Aguiar, puts forward a new concept for clouds: user-centric clouds and proposes a novel concept for clouds, where users self-organize to create their clouds.

The fourth paper, “Internet of Things – Technology, Challenges and Standards” by Debasis Bandyopadhyay and Jaydip Sen, introduces the key technological drivers, applications domains, challenges and future research areas in the domain of IoT. It also throws some light on the direction of future trends in this technology paradigm.

The fifth paper, “Collaborative and Cognitive Network Platforms: Vision and Research Challenges” by Ertan Onur, Yunua Durmus, Gamal M. Hawwas, Sonia Heemstra de Groot and Ignas Niemegeers, discusses the opportunities and challenges of a visionary concept referred to as collaborative and cognitive network platforms.

The sixth paper, “Physical Layer Cryptography and Cognitive Networks” by Lorenzo Mucchi, Luca Ronga and Enrico Del Re, presents a survey on physical layer security in cognitive radionetworks. Challenging problems are outlined due to the characteristic of accessing spectrum dynamically in cognitive radio networks.

The seventh paper, “Adapting Cognitive Radio Technology For Low Power Wireless Personal Area Network Devices” by John Rohde and Thomas Skjødberg Toftegaard, discusses the challenges associated with the implementation of highly reliable low-power wireless personal area networks (WPANs) for the future and the adaption of cognitive radio technology as a potential solution.

The eighth paper, “Managed Ecosystems of Networked Objects” by Jeroen Hoebeke, Eli De Poorter, Stefan Bouckaert, Ingrid Moerman and Piet Demeester, proposes the concept of managed ecosystem of networked objects (MENO), which aims to create a smart network architecture for groups of internet-connected objects by combining network virtualization and clean-slate end-to-end protocol design.

The ninth paper, “Quantum Key Distribution (QKD) Standardization in ETSI” by Walter Weigel and Gaby Lenhart, describes in the first part the background of this new key distribution technology for cryptographic keys, called QKD (quantum key distribution) and compares it to classic key distribution principles and its basic functioning. In the second part it introduces the need for QKD and the link to standardization, with its approach by the ISG (industry specification group) QKD in ETSI (European Telecommunication Standards Institute). Finally the article gives an outlook on the future next steps.

The tenth paper, “Business Models and Business Model Innovation in a “Secure and Distributed Cloud Clustering (DISC) Society” by Peter Lindgren and Yariv Taran, gives a conceptual futuristic outlook and state of the art business model research to what one can expect of business model innovation in a future distributed and secure cloud clustering society (DISC).

Author Biographies

R. Prasad is a distinguished educator and researcher in the field of wireless information and multimedia communications. Since June 1999, Prof. Prasad has been with Aalborg University, where currently he is Director of Center for Teleinfrastruktur (CTIF), and holds the chair of wireless information and multimedia communications. He has supervised over 60 PhDs and 15 PhDs are currently working with him. He was the coordinator of European Commission Sixth Framework Integrated Project MAGNET (My personal Adaptive Global NET) Beyond. He was involved in the European ACTS project FRAMES (Future Radio Wideband Multiple Access Systems) as a Delft University of Technology project leader. He is a project leader of several international, industrially funded projects. He has published over 700 technical papers, contributed to several books, and has authored, coauthored, and edited 30 books. He has served as a member of the advisory and program committees of several IEEE international conferences. In addition, Dr. Prasad is the coordinating editor and Editor-in-Chief of the *Springer International Journal on Wireless Personal Communications* and a member of the editorial board of other international journals. Prof. Prasad is the Founding Chairman of the European Center of Excellence in Telecommunications, known as HERMES, and now he is the Honorary Chair. He has received several international awards; among others the "Telenor Nordic 2005 Research Prize". He is a fellow of IEEE, a fellow of IETE, and a fellow of IET. He is a member of The Netherlands Electronics and Radio Society (NERG), and a member of IDA (Engineering Society in Denmark). Dr. Prasad is advisor to several multinational companies. Further, Prof. Prasad is the founding chairman of "Global ICT Standardization Forum for India (GISFI: <http://gisfi.org/>).

M. Ruggieri (Naples, Italy, 29/04/61) graduated in Electronics Engineering in 1984 at the University of Roma. She was: with FACE-ITT and GTC-ITT (Roanoke, VA) in the High Frequency Division (1985–1986); Research and Teaching Assistant at the University of Roma Tor Vergata (1986–1991); Associate Professor in Telecommunications at Univ. of L'Aquila (1991–1994) and at Tor Vergata (1994–2000). Since November 2000 she is Full Professor in Telecommunications at Tor Vergata. Since 2003 she directs a Master in "Advanced Satellite Communications and Navigation Systems" at Tor Vergata. Her research focuses on space communications and navigation systems, integrated systems, mobile and multimedia networks. Since 1999 she has been appointed in the Board of Governors of the IEEE Aerospace and Electronic Systems (AES) Society and, since 2005, Director for AESS Operations in Italy&Western Europe. Since January 2008 she is Executive Vice President of the IEEE AESS. In 2004–2006 she was in the Technical-Scientific Committee of the Italian Space Agency (ASI). In

2007–2008 she has been Vice-President of the ASI Technical-Scientific Committee. Since December 2007 she belongs to the Italian *Superior Council of Telecommunications* as Expert. Since December 2006 she is Vice President of the *AFCEA Rome Chapter*. In 2006–2007 she was Italian representative in the Technical Committee *Communications Systems* (TC6) of IFIP (International Federation for Information Processing). She is Director of *CTIF_Italy*, the Italian branch of the *Center for Teleinfrastruktur* (CTIF) in Aalborg (Danimarca), opened on September 28, 2006 at Tor Vergata. She has been P.I. of various national Programs funded by ASI and MIUR, an Internalization Program funded by MIUR, an ESA Ariadna Program and she has coordinated the RTV Unit in various European Projects funded by EU and GALILEO Joint Undertaking. She is Editor of the IEEE Transactions on AES for "Space Systems", Chair of the IEEE AES Space Systems Panel, Assistant Editor of the IEEE Aerospace and Electronic Systems Magazine. Since 2002, she is co-chair of Track 2 "Space Missions, Systems, and Architecture" of the AES Conference. She participates in the organisation of many international events. She was awarded the *1990 Piero Fanti International Prize* and she had a nomination for the *Harry M. Mimmo Award* in 1996 and the *Cristoforo Colombo Award* in 2002. She is author of about 250 papers, on international journals/transactions and proceedings of international conferences, book chapters and books. She is an IEEE Senior Member (S'84-M'85-SM'94), an AFCEA, IIN and AICA Member.

O. B. Madsen is born in 1942 in Denmark and received his M.Sc. in Mathematics & Computer Science from the University of Copenhagen. (1962–1972) researcher and from 1968 head of the Computer Science Laboratory at The Royal Danish Academy of Fine Arts in Copenhagen. (1972–1981) head of the Development Department, RECAU, the Regional Computing Centre at Århus University. (1981–1996) Head of the Data Network Section and Head of the Network Infrastructure Strategy section at Jutland Telephone. (1996–1999) Manager for Infrastructure Network Technology and Strategy at TDC, Tele Denmark. (1999) Professor in Distributed real-time Systems, from 2004–2009 as Head of NetSec, Networking and Security section, from 2004 Head of CNP, Center for Network Planning and Co-director for CTIF, Center for TeleInFrastructur at Aalborg University. He has been project leader for a number of national and international R&D projects and acted in high level advisory tasks within the European Commission on the R&D framework programs in DGXIII and with United Nations

UNDP activities. Present research is focused on Infrastructure Architecture and Modeling Tools for Network Analysis and Design.